

THE CLAIMS

The listing of claims will replace all prior versions, and listings, of claims in the application. Claims 11-15 and 24-27 are pending in this application.

Listing of Claims

Claims 1 - 10 (Cancelled)

11. (Currently Amended) A three-dimensional input apparatus comprising:

a projector for irradiating a detection light beam on an object;

a scanning mechanism for scanning said object by deflecting the direction of irradiation of said detection light beam;

an image sensing device with an image sensing surface including a plurality of two-dimensionally arranged light-receiving elements, for receiving the detection light beam reflected on said object; and

a controller for controlling the electric charge accumulation time of said plurality of light-receiving elements such that the scanning mechanism moves the detection light beam for each sampling period and a plurality of types of outputs with different electric charge accumulation times are produced by each of said light-receiving elements in one light-receiving area for each sampling period, discriminating whether at least one of said plurality of types of output signals is saturated for each one of the two-dimensionally arranged light-receiving elements or for each part of the two-dimensionally arranged light-receiving elements, and selecting non-saturated signals among said plurality of types of output signals for each one of the plurality of two-

dimensionally arranged light-receiving elements or for each part of the plurality of two-dimensionally arranged light-receiving elements, based on the result of the discrimination.

12. (Original) An apparatus according to claim 11,

wherein said controller controls said image sensing device so as to output a signal corresponding to the accumulated electric charge upon lapse of a first accumulation time and continue to accumulate electric charge while maintaining said accumulated electric charge until a second charge accumulation time.

13. (Original) An apparatus according to claim 12,

wherein said controller selects among said non-saturated signals one having a long electric charge accumulation time.

14. (Original) An apparatus according to claim 11,

wherein said controller selects among said non-saturated signals one having a long electric charge accumulation time.

15. (Previously Presented) A three-dimensional input apparatus comprising: a projector for irradiating a detection light beam on an object;

a scanning mechanism for scanning said object by deflecting the direction of irradiation of said detection light beam;

an image sensing device having an image sensing surface including a plurality of two-dimensionally arranged light-receiving elements for receiving the detection light beam reflected on said object;

a controller for controlling said image sensing device so as to output a first signal due to a first electric charge accumulation time and a second signal due to a second electric charge accumulation time equal to a predetermined multiple of said first signal during the electric charge accumulation of said image sensing device;

a selecting circuit for selecting said second signal in the case where said second signal has not been saturated and selecting a signal of a size equal to said predetermined multiple of said first signal in the case where said second signal has been saturated; and

a processor for performing calculations using the selected signal, said selecting circuit including:

a first switch, a second switch, a memory, a comparator, and an integrator, wherein

said first switch receives the first and second signals, outputs the first signal to the memory and outputs the second signal to the second switch and to the comparator,

the integrator receives the first signal from the memory and outputs the signal of a size equal to said predetermined multiple of said first signal to the second switch, and

the comparator compares the second signal to a reference saturation level and outputs a control signal to the second switch to output the second signal where the second signal has not been saturated, and to output the signal of a size equal to said predetermined multiple where the second signal has been saturated.

Claims 16 - 23 (Cancelled)

24. (Currently Amended) A three-dimensional input method comprising:

irradiating a detection light beam on an object;

scanning said object by deflecting the direction of irradiation of said detection light beam;

receiving the detection light beam reflected on said object by an image sensing device with an image sensing surface including a plurality of two-dimensionally arranged light-receiving elements;

controlling the electric charge accumulation time of said light-receiving elements such that the scanning mechanism moves the detection light beam for each sampling period and a plurality of types of outputs with different electric charge accumulation times are produced by each of said light-receiving elements in one light-receiving area for each sampling period; ~~a plurality of types of outputs with different electric charge accumulation times are produced by each of said light-receiving elements;~~

discriminating whether at least one of said plurality of types of output signals is saturated for each one of the two-dimensionally arranged light-receiving elements or for each part of the two-dimensionally arranged light-receiving elements; and

selecting non-saturated signals among said plurality of types of output signals for each one of the plurality of two-dimensionally arranged light-receiving elements or for each part of the plurality of two-dimensionally arranged light-receiving elements, based on the result of the discrimination.

25. (Previously Presented) A method according to claim 24, wherein said controlling of the electric charge accumulation time is carried out so that said image sensing device outputs a signal corresponding to the accumulated electric charge upon lapse of a first accumulation time and continue to accumulate electric charge while maintaining said accumulated electric charge until a second charge accumulation time.

26. (Previously Presented) A method according to claim 24, wherein said selection of the non-saturated signals is carried out so that non-saturated signals having a long electric charge accumulation time are selected.

27. (Previously Presented) A method according to claim 25, wherein said selection of the non-saturated signals is carried out so that non-saturated signals having a long electric charge accumulation time are selected.